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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/775,250

02/01/2001

Timothy Wayne Crockett

RPS920000103US1

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08/14/2002

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EXAMINER

PATEL, ISHWARBHAI B

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 08/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/775,250

Applicant(s)

CROCKETT ET AL.

Examiner

Ishwar (I. B.) Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 8 and 20-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 May 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of group I, claims 1-20, in Paper No. 7 and 9 are acknowledged. Also, acknowledged is the election of specie 2, claims 1-7 and 9-19.

Drawings

2. The drawings are objected to because the figures are improperly cross hatched. All of the parts shown in section, and only those parts, must be cross hatched. The cross hatching patterns should be selected from those shown on page 600-81 of the MPEP based on the material of the part. See also 37 CFR 1.84(h)(3) and MPEP 608.02. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-7,9-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwong et al., US Patent No. 6,388,890, hereafter Kwong, in view of Takagi et al., US Patent No. 4,800,459, hereafter Takagi.

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Regarding claim 1,9,10 and 11,Kwong discloses a printed circuit board, comprising:

a plurality of conductive layers, wherein one of said plurality of conductive layers is a first layer, wherein one of said plurality of conductive layers is a second layer; two or more vias interconnecting two or more conductive layers of said plurality of conductive layers (conductive layers 12, 14, 16a, 16b, 16c, 16d, 18a, 18b, 18c, 18d, 18e, 18f, first conductive layer 16a, second conductive layer 16d, vias 20, 22, 24 and 26, see figure 1, column 4, line 10-44), but

fails to disclose an electrical component embedded in said second of said two or more vias between two conductive layers of said plurality of conductive layers, however electrical components in the vias holes or cavities are is known in the art to reduce the substrate space required. Smith discloses a resistor formed in the via holes and Takagi discloses resistor and capacitor formed in the cavity. Further any via or layer can be configured for any specific requirement and such configuration is inherent in the printed circuit board art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the circuit board of Kwong with electrical component formed in the second via as taught by Takagi and Smith in order to reduce the space requirement of the substrate.

Regarding claims 2 and 12, the modified circuit board of Kwong further discloses the capacitor as the electrical component.

Regarding claim 13, the modified circuit board of Kwong further discloses the resistor as the electrical component.

Regarding claim 3, the applicant is claiming the relative location of the first and second via. However the locations of the vias can be adjusted depending upon the routing of the traces and the spacing in the substrate. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the circuit board of Kwong with second of said two or more vias adjacent to the said first via in order to accommodate the better trace routing in the space available.

Regarding claims 4-7 and 16-18, the applicant is claiming various shape of the electrical component in the via. Though, the modified assembly of kwong does not explicitly disclose various shape, the component with any shape can be formed depending upon the shape of the via and feasibility of manufacturing at affordable cost. Further, the applicant is not claiming any specific benefit or drawback of one shape over the other. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the circuit board of Kwong with electrical element with shape as claimed in claims 4-7 and 16-18 in order to form the element in cost effective manner depending upon the cross section of the via.

Regarding claims 14 and 15, the applicant is claiming an inductor as claimed in claim 14 and a diode as claimed in claim 15. However, both inductor and diode are known in the art and can be formed depending upon a specific requirement in the system. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the circuit board of Kwong with the electrical element as an inductor or a diode in order to meet the functionality of the system.

Regarding claim 19, though the modified assembly of Kwong disclose the metal electrical connection means, see Takagi figure 1, electrical connection 29-30 and 33-34 for the resistor and capacitor respectively, except tinning the same. However, tinning is known in the art for better electrical connection. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the circuit board of Kwong with the electrical component having tinned cap in order to have better and reliable electrical connection.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kambe et al., Higgins, III, Sanso, Forehand et al., Johnson, Felton, Selna, Kresge et al., and Ehman et al., disclose circuit board similar to applicant's claimed invention.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (703) 305 2617. The examiner can normally be reached on M-F (6:30 - 4) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L Talbott can be reached on (703) 305 9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305 3431 for regular communications and (703) 305 7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

ibp
August 6, 2002


Klee
Primary Examiner